

## INFLUENCE OF LEVEL OF SUPPLEMENTAL ALFALFA HAY ON THE PERFORMANCE OF BEEF COWS GRAZING WINTER BLUESTEM RANGE

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### Summary

One hundred thirteen pregnant Hereford × Angus cows were used to study the effect of increasing levels of supplemental alfalfa hay on performance when grazing winter bluestem range. Although no differences were observed in reproductive performance, increasing the amount supplemental alfalfa from approximately .5% up to 1.0% of body weight resulted in increased weight gain and reduced condition loss in cows and increased weaning weight in calves. However, time spent grazing was significantly decreased in those groups receiving larger amounts of supplemental alfalfa.

(Key Words: Protein Supplementation, Alfalfa Hay, Beef Cows, Winter Range.)

### Introduction

Previous reports (KAES Reports of Progress 514, 539) have documented the benefits of protein supplementation for pregnant beef cows grazing winter tallgrass prairie. When fed to provide similar amounts of crude protein, alfalfa hay and soybean meal/grain sorghum supplements elicited similar performance responses in beef cows (KAES Report of Progress 567). Because alfalfa hay is more bulky and fibrous than concentrate supplements, it occupies more of the available ruminal space and, therefore, could reduce intake of grazed forage (KAES Report of Progress 623). However, some question remains as to the optimum amount of alfalfa

hay to feed as a protein supplement. Our objective in this experiment was to determine the effects of different amounts of supplemental alfalfa hay on the performance of pregnant beef cows grazing winter tallgrass range forage.

### Experimental Procedures

One hundred thirteen pregnant Hereford × Angus cows (avg initial wt = 1106 lb; avg initial body condition = 5.42; 1-9 scale) were randomly assigned to one of three supplemental levels of alfalfa hay (19.4% crude protein; 47.9% neutral detergent fiber): 1) .48% BW/hd daily (about 5.3 lb); 2) .72% BW/hd daily (about 7.9 lb); or 3) .96% BW/hd daily (about 10.5 lb), DM basis. Supplementation with the three levels of alfalfa began on November 27, 1990 and continued until each cow calved (average calving date = March 7), after which each cow was fed 9.4 lb/hd/day alfalfa DM (10 lb/hd/day as-fed) until sufficient new grass growth was available (mid-April). Cows grazed pastures dominated by big bluestem (*Andropogon gerardii*), indiagrass (*Sorghastrum nutans*), and little bluestem (*Andropogon scoparius*). Cows were weighed and scored for body condition on days 0 (November 27), 30, 59, 87, 101 (within 48 h of calving), 158 (beginning of breeding season), and 333 (weaning) following an overnight stand without access to feed or water. In January and February, collar-mounted vibration recorders were used to measure the grazing time of 6 cows from each treatment.

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## Results and Discussion

Cow gained increased with increasing alfalfa level over the first month of the experiment (Figure 1; linear,  $P = .01$ ). However, level of supplemental alfalfa did not affect subsequent weight changes ( $P > .10$ ) through calving. The reason for the lack of weight response after the first month is unclear, but it is probably different in ruminal fill. Similar treatments applied to beef steers in a confinement trial (KAES Report of Progress 623) resulted in either no change or a drop in ruminal fill with increasing levels of alfalfa. By calving, cows fed the highest alfalfa level had lost 119 lb from their initial weight, whereas cows on the lower two levels lost an average of 153 lb. From calving to breeding, cows fed the highest level of alfalfa lost the most weight (quadratic,  $P = .06$ ), causing their cumulative weight change to be similar ( $P > .10$ ) to that of the other two groups. No treatment differences occurred for weight change from breeding to weaning ( $P > .10$ ).

Cows fed the lowest level of alfalfa tended (quadratic,  $P = .13$ ) to lose more condition than those fed higher levels of alfalfa over the first month of supplementation and lost more (linear,  $P = .06$ ) condition over the second month (Figure 2). No treatment differences ( $P > .10$ ) occurred over subsequent periods through breeding, after which cows previously fed the lowest level

of alfalfa gained the most (linear,  $P = .03$ ) condition. Cumulative condition changes were similar for all treatments by weaning time. Cumulative cow body condition changes at calving increased in direct proportion ( $P = .02$ ) to increasing alfalfa. However, all groups had lost sufficient body condition to be below an average body condition of 5 at calving, suggesting the potential for reduced reproductive performance.

However, in spite of the differences in body condition at calving (relative to initial condition), reproductive performance was acceptable and unaffected ( $P > .10$ ) by treatment. Overall pregnancy rate was 92.9%, with 63.4, 26.7, and 9.9% of those pregnant being bred in subsequent thirds of the 60 d breeding season. Calf birth and weaning weights increased in a curvilinear fashion (quadratic;  $P = .04$ ) with increasing alfalfa (birth weight = 78, 83, and 82 lb; weaning weight = 492, 491, and 517 lb for low, moderate, and high levels of alfalfa, respectively).

Treatment effects on total grazing time were similar ( $P > .10$ ) for the January and February measurement periods and decreased in direct proportion ( $P = .03$ ) to increasing alfalfa hay (6.3, 4.9, and 5.0 hd/day for low, moderate, and high levels of alfalfa, respectively). This suggests that the higher levels of alfalfa hay were substituting for intake of grazed forage, which is substantiated by confinement studies with steers (KAES Report of Progress 623).

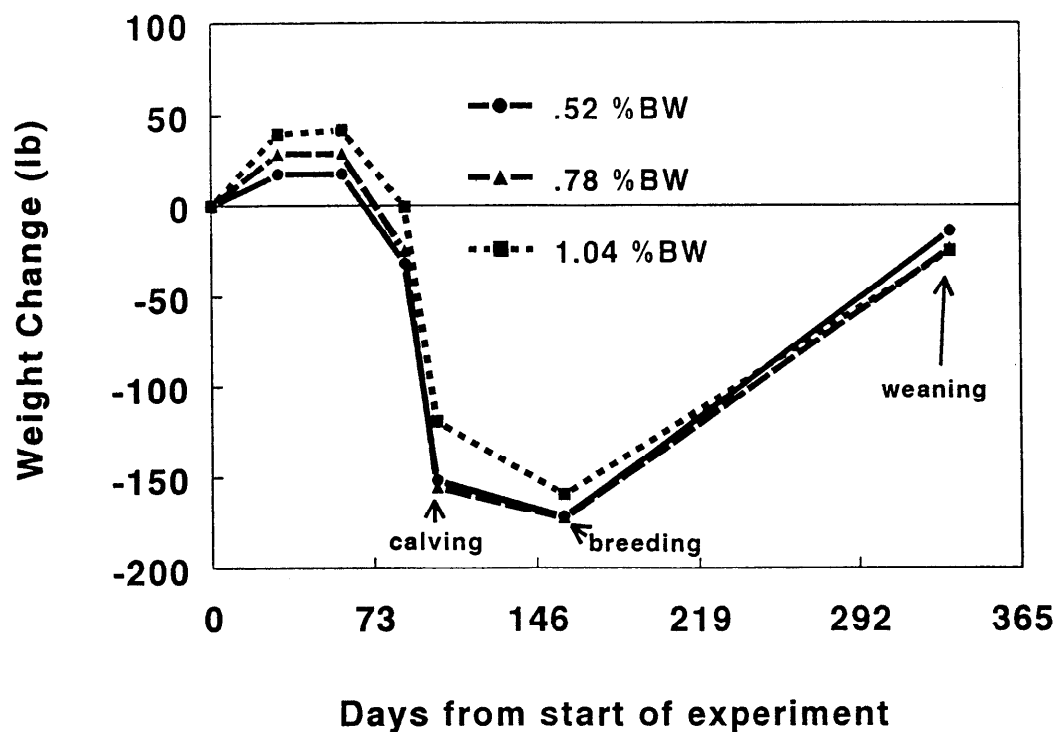


Figure 1. Influence of Level of Winter Alfalfa Supplementation on Weight Change of Cows Grazing Bluestem Range (day 0 = November 27; avg initial weight = 1106 lb).

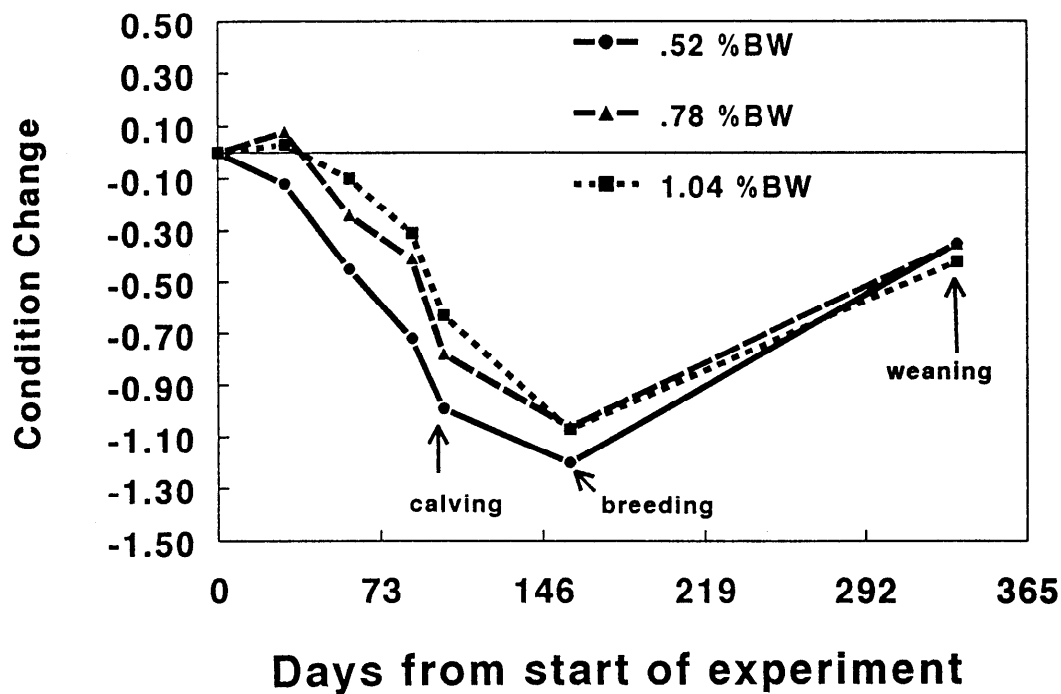


Figure 2. Influence of Level of Winter Alfalfa Supplementation on Condition Change of Cows Grazing Bluestem Range (day 0 = November 27; avg initial control = 5.4 on 1-9 scale).